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AUTHOR Schwarz, J. Conrad
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ABSTRACT

The construct validity of four measures of delay of gratification as indices of a stable personality disposition--that is, the disposition to adaptively delay gratification--is examined. The four measures (Choice-to-Delay, Wait-to-Accumulate, Wait-upon-Request, and Ratings by Knowledgeable Informants) are described and empirical evidence that bears on their construct validity with preschoolers is assessed. Three types of evidence which seem to be relevant in determining the construct validity of such a personality trait are reliability, convergent validity, and discriminant validity. Results of a research program focusing on these issues suggest that (1) ratings by multiple knowledgeable informants seem to be the most promising method for obtaining valid indices of the disposition to adaptively delay gratification; (2) the Wait-upon-Request task seems promising as an early index of delay attributes that may be stable over time; (3) Wait-to-Accumulate shows a sex difference in validity that may be due to modal differences between males and females in the saliency of specific social motives; and (4) Choice-to-Delay seems not to be valid as an index of a stable disposition to adaptively delay gratification. (Author/RH)

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Measuring Individual Differences in Self-Control and Self-Regulation in Early Childhood*

J. Conrad Schwarz

The University of Connecticut

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The focus of my presentation is on one aspect of self-control and self-regulation, namely, delay of gratification. There have been two major lines of empirical research on this topic. One has emphasized situational factors that influence decisions to delay gratification. The other has emphasized stable individual differences in delay of gratification and their developmental and prognostic correlates. An example of the latter is Mischel's research in the early 60's (1966) that related delay of gratification to father absence and delinquency.

My presentation will focus on delay of gratification as a stable personality trait. I do so despite the strong possibility that Mischel's disenchantment in the late 60's (1968) with personality traits arose from his own research on this topic. More specifically, I will examine the construct validity of four measures of delay of gratification as indices of a stable personality disposition, the disposition to adaptively delay gratification. Next, I will describe the four measures, and then we'll look at some empirical evidence that bears on their construct validity with preschoolers.

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First, Choice-to-Delay, illustrated there: Choice-to-Delay involves a choice between a less valued reward, available immediately, and a more valued reward, available only after a delay of several hours or days. For example, the examiner would say, "You may have a penny now, or a nickel tomorrow." Typically, a series of four or more choice pairs is administered.

Second, Wait-to-Accumulate, illustrated there: In Wait-to-Accumulate, small rewards are placed one by one, with increasing duration between placements, into a cup for the child to keep. The interval between placement of the 9 rewards lengthens progressively from 10 to 90 seconds. Upon each placement, the child is reminded, "You may take those now, or you may wait for more." Before starting the task, we have the child examine, taste, and rank order by preference, six rewards: M & M's, Fruit Loops, raisins, candy corn, foil stars, and animal stickers. The first trial is conducted with the most preferred reward, the second with the second most preferred, and so forth. Each child receives at least two trials, and the score is the average number of rewards accumulated on each trial.

Third, Wait-upon-Request, illustrated there: Wait-upon-Request is appropriate for children between 2 and 3 years of age. The examiner places an M & M or raisin under one of three boxes while the child watches, and then tells the child, "Wait until I ring the bell, and then find the candy. Don't touch the box until I ring the bell." We administer the task with two practice trials and ten scored trials. The waiting interval used for each trial varies haphazardly from 5 to 90 seconds.

The fourth method employed is Ratings by Knowledgeable Informants. These are informants who have observed the child in a variety of contexts over a fairly long period, at least several weeks. Each rater is provided

with an 11-point equal-interval scale that has anchoring descriptions at 4 out of the 11 points. The most extensive anchor is the following: "When waiting his or her turn for food, toy, or any object which is of interest, or when waiting to take part in some activity, he or she seems unusually unable to wait for gratification."

Each of these measures has high face validity as an index of delay of gratification; few would argue that the child who waits for greater reward is not delaying gratification. But the question of concern is whether the child's behavior in these structured situations has generality to other situations on other days. Does the task score reflect a generalized disposition that is predictive of behavior in other situations?

What characteristics would be required as evidence of the construct validity of a measure of such a personality trait? Three types of evidence are relevant: that of reliability, of convergent validity with other theoretically related constructs, and that of discriminant validity from theoretically independent constructs. First, let's consider reliability.

If the separate similar parts of a measure do not relate to each other, their sum is not likely to relate to anything else. Table 1 presents internal-consistency reliability information on our four measures of delay of gratification. Without going into a lot of detail, there are a few points that I would like to draw to your attention:

First, individual Choice-of-Delay items have very low reliability. If you will look under the column labeled "mean inter-item correlation," you will see that across several studies, the average correlation between one choice pair and another choice pair is about .25, whereas the average

correlation between pairs of trials on Wait-to-Accumulate is above .50 and on Wait-upon-Request is above .40. There are a number of studies in the literature in which a single Choice-of-Delay trial was used as a measure of disposition to delay gratification. These data indicate that the use of single items, especially of the Choice-of-Delay type, causes a grave risk of Type II error; that is, accepting the null hypothesis, the hypothesis of no difference or no correlation, when it is, in fact, false.

Single trials of Wait-to-Accumulate and Wait-upon-Request are of marginal reliability; however, sets of 4 to 10 trials yield total scores of high internal consistency. Again, most researchers use only a single trial of the Wait-to-Accumulate type.

The average inter-rater correlation of .42 for teacher's ratings of delay of gratification was based on nine teacher pairs, three from each of three preschool classrooms. Ratings by single teachers are also of marginal adequacy for research; however, the average of ratings by three or more knowledgeable informants (teachers, parents, etc.) would yield a measure of adequate reliability.

What convergent validity relationships would be expected of a valid measure of the disposition to adaptively delay gratification?

First, since children seem to show more adaptive self-regulation as they grow older, we would expect the measure to correlate with age, especially in the preschool years. Second, we would expect moderate correlations with IQ, since the ability to understand the long-range consequences of acts may facilitate delay of gratification. Third, a valid measure would be expected to correlate with measures of other overlapping personality traits.

Children who are high in delay of gratification would be attentive in a school setting, not hyperactive; cooperative, not hostile; and introverted and reflective, not highly extraverted. Fourth, since females may be higher on some of these personality variables, they would score higher than males. Finally, we would expect a valid measure to correlate highly with other valid measures of the disposition to delay gratification.

In terms of discriminant validity, a valid measure would be unrelated to measures of social-desirability response set.

Now let's take a look at some data. Table 4 shows data from a study Ron Testa and I conducted with 49 preschoolers from 3 to 5 years of age at The University of Connecticut Child Lab. Three delay-of-gratification measures were obtained: a Choice-to-Delay measure, based on four choice pairs; a Wait-to-Accumulate measure, based on the average of from 2 to 4 trails; and a rating of disposition to delay gratification, based on the average rating of three teachers.

The next three variables listed on Table 4, Task Orientation, Introversion-Extraversion, the Friendly-Hostile, were based on the average of three teachers' responses to scales from the Classroom Behavior Inventory developed by Schaeffer, Aaronson, and Small. The Social Desirability score was based on an adaptation of the Ford and Rubin (1970) scale. Sample items are the following: "Do you sometimes argue with your mother?" "Do you always wash your hands before every meal?" The IQ score came from the Peabody Picture Vocabulary Test.

I have placed the Task Orientation scale next to the delay-of-gratification scales, because, of all the other variables, it ought to be most

highly correlated with the disposition to delay gratification. A sample item is the following: "Pays attention to what he/she is doing when other things are going on around him/her."

The major conclusions that I will draw from this table are that, of the three delay-of-gratification measures, the Teachers' Rating of Delay has the strongest evidence of validity and the Choice-of-Delay has the weakest evidence of validity as a measure of the disposition to adaptively delay gratification.

Let's examine the evidence. Here we see that the two behavioral tasks, Choice-of-Delay and Wait-to-Accumulate, correlate .46, but neither correlates significantly with teacher ratings of either delay of gratification or Task Orientation. There is a substantial correlation between Teachers' ratings of Delay of Gratification and Task Orientation, .56.

At the other side of Table 4 we see the correlations with age. Teachers' ratings of both Delay of Gratification and Task Orientation increase with age over this range of from 3 to 5 years, whereas, there is no evidence of increase with age for delay as measured by the Choice-to-Delay task, and only a slight, nonsignificant positive trend for the Wait-to-Accumulate task. We see other problems for the Choice-to-Delay measure: Children who chose the more highly valued delayed reward are not more intelligent. They are also low in social desirability, and they tend to be hostile rather than friendly. Subjects <u>high</u> in social desirability are choosing the <u>less</u> valued immediate rewards.

On the other hand, subjects rated high on Delay of Gratification by teachers fit better our theoretical predictions: They are high on task orientation; they are friendly rather than hostile; they are older; they

are more likely to be female than male; and they tend to be brighter and more introverted. The evidence for the validity of the Wait-to-Accumulate task exists mostly in nonsignificant trends.

I was not surprised that teachers' ratings looked so good. After all, they are based on an extensive period of observation of the children in a great variety of interactions. The idiosyncratic biases that no doubt exist for individual teachers are compensated for, to a degree, by averaging across three teacher raters. The weakness of the Choice-to-Delay task, however, may have come as a surprise to some. Was this just a fluke, an unrepresentative finding? Is there really no correlation with age on this task with children from 3 to 5, a period during which children seem to make great strides in self-regulation? These findings on the Choice-of-Delay task are congruent with our previous negative findings with this paradigm on children of the same and older ages.

That evidence is summarized on Table 3. If you will look at the Schwarz, Schrager, and Lyons study with 3- to 5-year-olds in the lower half of the table just above the Schwarz and Testa study, you will see similar results for sex, age, and IQ. In this study we used the same set of four choice-pairs. There were 22 children at each age level, that is, at 3, 4, and 5 years of age, for a total sample of 66 daycare children. Half the children at each age level were promised the delayed reward at the end of the day, and the other half were promised the reward the next day. While the length of the delay made a difference within each of the three age groups, within each delay condition there was no correlation with age; three-year-olds chose the delayed reward as often as five-year-olds when either the 7-hour or the 24-hour delay was employed. As in the

Schwarz and Testa study, less intelligent children tended to chose the delayed reward.

Data on Choice-to-Delay for children 7 and 10 years of age, shown above in Table 3, also parallel our findings with 3- to 5-year-olds. This gives us confidence in the results of the Schwarz and Testa study.

Next, I wish to present a preliminary report of a short-term longitudinal study that included Wait-upon-Request as part of an evaluation of children in Bermuda at 2 and 4 years of age. This project is headed by Sandra Scarr and involves, in addition to myself, Barbara Caparulo, David Furrow, Kathy McCartney, Randy Billington, and Debra Phillips. The Wait-upon-Request task was administered to 119 children when they were 24 to 30 months of age and the Wait-to-Accumulate task to 54 of the same children when they were 41 to 51 months of age. Other personality and cognitive assessments were made at both ages. These data permit a look at the predictive relationship between self-control at 2 years of age and self-regulation at 4 years of age.

What I am going to show you next, in Table 7, is a matrix of intercorrelations between selected variables assessed at 2 and 4 years of age on the same sample of 53 children.

At 2 years of age we have, in addition to the Wait-upon-Request scores, IQ test scores based on the Stanford-Binet, or a combination of Bayley and Stanford-Binet, and ratings of Overactivity made by the examiner after observing the child at home during the assessment visit. The Overactivity items came from the Childhood Personality Scale (CPS), developed by Dibble and Cohen (1974). A sample item is the following: "Jumps, runs, and is on the move. Can't seem to be still for long."

At the 4-year assessment all children were reevaluated by a different examiner in a different setting. The Wait-to-Accumulate task, administered in place of the Wait-upon-Request task, was similar to that in the Schwarz and Testa study.

It may be noted in Table 7, that the 2-year and 4-year IQ scores correlate .74, and that the 2-year and 4-year Overactivity scores correlate .58. The stability of the Overactivity rating is really quite remarkable. Individual differences in Overactivity seem quite stable in the preschool years.

In contrast, the correlation of .18 between the 2-year Wait-upon-Request scores and the 4-year Wait-to-Accumulate scores is quite low, and although positive, is not statistically significant. Thus, while subjects show stability on a personality trait, Overactivity, one that is the opposite of delay, we do not see a correlation between the two behavioral measures of delay over the same time period. Wait-to-Accumulate seems to be the weak link.

Furthermore, one may note that, while the 4-year IQ and Overactivity scores correlate with the 2-year Wait-upon-Request scores, they do not correlate significantly with the 4-year Wait-to-Accumulate scores. Looking at it from the other direction, 2-year Wait-upon-Request scores significantly predicted Overactivity two years later, at year 4.

If we construe Overactivity as lack of delay, this correlation of -.45 supports the construct validity of the Wait-upon-Request task as an early index of later disposition to adaptively delay gratification.

Now, looking at the right-hand side of Table 7, you will note that, despite the very restricted age range (6 months) at the 2-year assessment,

there was a positive age trend for Wait-upon-Request scores. Also females scored significantly higher than males at age 2. Although I don't have time to go over Tables 5 and 6, let me mention that they give a breakdown of the age, sex, and IQ effects on Wait-upon-Request scores.

I'd like to turn our attention back to the .18 correlation between Wait-upon-Request at year 2 and Wait-to-Accumulate at year 4. When we separated subjects into male and female subgroups, we found markedly different values for this correlation. On Table 8 you can see that the correlation was .57 for males and statistically significant, whereas, the comparable value was -.16 for females. These two coefficients were significantly different at the .005 level. The Wait-upon-Request scores of males and females have about the same pattern of correlations with other variables. In contrast, the Wait-to-Accumulate scores have markedly different patterns of correlations for males and females. For males, Wait-to-Accumulate looked like a valid measure of the personality variable, disposition to adaptively delay gratification; but for females, there was no evidence for the validity of the Wait-to-Accumulate task.

Since these samples of males and females are rather small, chance may have played a large part in causing these differences. This possibility lead me to examine the correlations of Wait-to-Accumulate for males and females from The University of Connecticut Child Lab. As shown on Table 9, the Wait-to-Accumulate scores of males from the Schwarz and Tests study were significantly and meaningfully correlated with other variables, whereas the scores for females were not. The pattern of relationships for Connecticut males was similar in many respects to that for males in Bermuda. Males

with high scores on Wait-to-Accumulate in both Bermuda and Connecticut tended to score high on another valid measure of delay of gratification, tended not to be overactive, and were older than low-scoring males. These congruences suggest that the sex differences on Wait-to-Accumulate were not due to chance.

It would appear that males and females, on the average, approach this task with different motives. The fact that high-scoring males in the Schwarz and Testa study tended to be task-oriented, extraverted, and hostile suggests the possibility that males perceive this as a competitive situation. This perception favors the performance of the most competitive, self-assertive male children. It remains a mystery what personal qualities or motives contribute to high performance in females. My favorite hypothesis is that, for some females, self-discipline is reflected in denial of reward, and these females, having accepted few rewards, score low on Wait-to-Accumulate; whereas, for other females, self-discipline manifests itself in waiting patiently, and these females accumulate many rewards, just as do the assertive males. If these two approaches were represented equally among females, zero correlations would be expected between the Wait-to-Accumulate scores of females and valid measures of disposition to adaptively delay gratification.

I would like to summarize the conclusions that I think can be drawn from this research program:

First, ratings by multiple knowledgeable informants seem to be the most promising method for obtaining valid indices of the disposition to adaptively delay gratification.

Second, the Wait-upon-Request task seems promising as an early index of delay attributes that may be stable over time.

Third, Wait-to-Accumulate shows a sex difference in validity that may be due to modal differences between males and females in the saliency of specific social motives, namely, winning versus cooperating.

Fourth, Choice-to-Delay seems not to be valid as an index of a stable disposition to adaptively delay gratification.

One of the most valuable lessons I have learned from this program of research is a healthy respect for the potency of social motives and the sensitivity of young children to social approval. Very often, it seems, self- and other-approval far outweighed the value of the tangible rewards offered in our behavioral tests. To underscore the complexity of these deceptively simple behavioral tasks, I have provided in Table 2 a list of the expectancies and reinforcements that may constitute the motivational matrix operating during each of these tasks. Single X's indicate a potentially significant factor and double X's, a very important factor in a given task. I leave the list for you to examine at your leisure. It may further illustrate why face validity is not a sufficient basis for judging the utility of behavioral tasks as measures of personality traits.

Thank you.

REFERENCE NOTES

Alley, P.R. & Schwarz, J.C. The influence of hunger and personality variables on children's delay of gratification behavior. Manuscript in preparation, 1981.

Schaefer, E.S., Aaronson, M.R. & Small, V.H. Classroom Behavior Inventory. National Institute of Mental Health, 5600 Fishers Lane, Rockville, Maryland 20852.

Schwarz, J.C. & Alley, P.R. Delay of gratification as a function of hunger, age, sex, experimenter sex, and personality. Manuscript in preparation, 1981.

Schwarz, J.C., Scarr, S.W., Caparulo, B., Furrow, D., McCartney, K.A., Billington, R. & Phillips, D.A. Delay of gratification at two and four years of age: A short-term longitudinal study. Manuscript in preparation, 1981.

Schwarz, J.C., Schrager, J.B. & Lyons, A.E. Delay of gratification by preschoolers: Evidence for the validity of the choice paradigm. Manuscript submitted for publication, 1980.

Schwarz, J.C. & Testa, R.J. Delay of gratification: The construct validity of behavioral measures with preschoolers. Manuscript in preparation, 1981.

REFERENCES

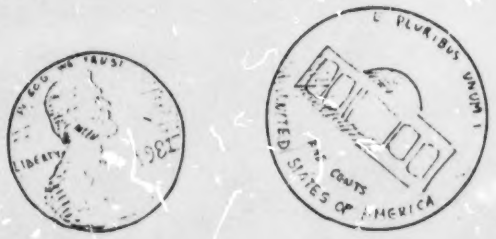
Dibble, E. & Cohen, D.J. Companion instruments for measuring children's competence and parental style. Archives of General Psychiatry, 1974, 30, 805-815.

Ford, L.H. & Rubin, B.M. A social desirability questionnaire for young children. Journal of Consulting and Clinical Psychology, 1970, 35, 195-204.

Mischel, W., Personality and Assessment. New York: Wiley, 1968.

Mischel, W. Theory and research on the antecedents of self-imposed delay of reward. In B.A. Maher (Ed.), Progress in experimental personality research. Vol. 3. New York: Academic Press, 1966.

CHOICE OF DELAY



1¢ NOW 5¢ LATER

WAIT TO ACCUMULATE

WAIT UPON REQUEST

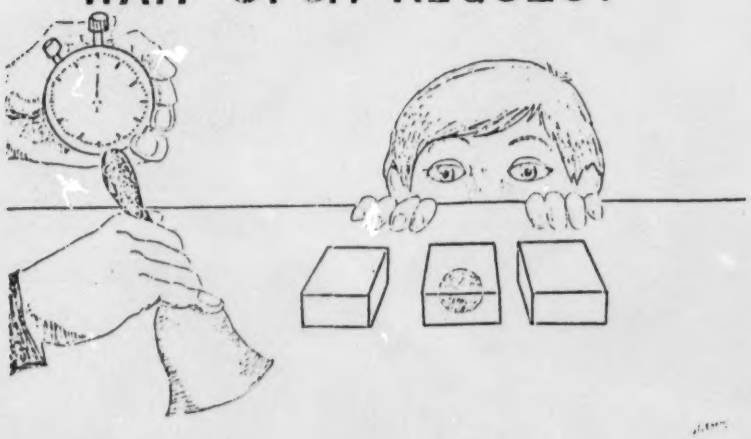


Table 1

Internal Consistency Reliability Information on Four Measures of Delay of Gratification

Measure Study Age of Subjects	Method Notes	Features of Measure	N	Mean inter-item r	Median corrected item-tot. r	Reliability internal consistency (alpha)
Choice of Small Immediate vs. Large Delayed Reward						
Schwarz & Alley Hunger/Satiation I 7 & 10 yr. olds	Photo & tape presentation of choices	6 food pairs 6 nonfood pairs 1 wk.delay	66 70	.08 .14	.16 .17	.34 .49
Alley & Schwarz Hunger/Satiation II 10 yr. olds	Real display, booklet group test	5 food pairs 5 nonfood pairs 1 wk.delay	108 108	.27 .27	.39 .43	.65 .65
Schwarz, Schrager, & Lyons Delay Len. 3-5 yr. olds	Qualitative diff. in value	4 pairs,7-hr.del. 4 pairs,1-day delay	33 33	.42 .24	.53 .35	.74 .55
Schwarz & Testa Trust Training 3-5 yr. olds	Qualitative diff. in value	4 pairs,1-day delay	49	.25	.35	.57
Voluntary Waiting to Accumulate Rewards						
Schwarz & Testa Trust Training 3-5 yr. olds	Rewards ranked by each subject	1 or 2 food & 1 or 2 nonfood trials	49	.73	.73	.84
Scarr, Schwarz et al. Bermuda Study 4 yr. olds	Subject's preferred rewards used	2 to 5 trials food &/or nonfood	50	.52	.74	.84
Requested Waiting Trial by Trial						
Scarr, Schwarz et al. Bermuda Study 2 yr. olds		5 tr.(5-40 sec.) 5 tr.(50-90 sec.) 10 tr.(5-90 sec.)	120 120 120	.43 .51 .44	.59 .63 .64	.79 .84 .89
Delay of Gratification Rating by Three Teachers						
Schwarz & Testa Trust Training 3-5 yr. olds		Single 11-pt. Rating Scale	49	.42*		.68**

*mean inter-rater r
**generalizability to universe of raters

SCRD, Boston, April, 1981
Dr. J. Conrad Schwarz, Dept. of Psych.
University of Connecticut, Storrs, Connecticut 06268

Table 2

Factors Affecting Decisions to Wait on Behavioral Measures of Delay of Gratification

	Decision: Not Wait	Decision: Wait	Measure: Choice of Delay	Measure: Wait to Accumulate	Measure: Wait Upon Request
I.	Primary Hedonism: What can I get out of this?				
	Expectancy Factors				
	A. E will not keep promise to deliver rewards.	A. E will deliver rewards as promised.	xx	x	
	B. E will not let S keep or eat rewards.	B. E will let S keep rewards even if S gets many.		x	
	Reinforcement Value Factors				
	A. S wants highly valued reward immediately (naive hedonism).	A. Easy to wait for reward of low value.	x	x	x
	B. No tangible reward for waiting.	B. Waiting maximizes tangible reward (enlightened hedonism)	xx	xx	
	C. Exposure raises immediate value by causing "hot ideation".	C. No exposure of reward.		xx	x
	D. S wants to avoid E and return to peers or parent.	D. S wants to be with E.	x	xx	x
II.	Other Approval: What will make E like (not hate) me?				
	A. E will be angry if I take reward immediately.	A. E will be happy if I wait.	x	x	xx
	B. E will be angry if I take many rewards. (Bad manners; limited supply: poor E).	B. E wants me to have many rewards, win the maximum.	x	x	
	C. E is tired of waiting, wants to leave and not return.	C. E likes waiting and wants to be with and see me again.	x	xx	
III.	Self-Approval: What will make me feel proud (not guilty)?				
	A. I don't deserve this much reward.	A. I earned and deserve this reward and more.	xx	x	
	B. I feel guilty winning such an easy game.	B. I feel proud to have won this game.		x	
	C. There will not be enough rewards for other children (unjust share).	C. There will be plenty of rewards for others (just share).	x	x	

Table 3

Choice of Small Immediate vs. Large Delayed Rewards: Correlates of Delayed Reward Choice at Various Ages

Study	Features of Study										
Age of Subjects	Structuring of Expectancy for Delayed Reward	Experimental Treatment Effects		Conditions	N	Sex 1=M 2=F	Age	Academic Aptitude	Discipline	Hostility	Social Desirability
Schwarz & Alley								Teacher Rating	Peer Rating	Peer Rating	
10 yr. olds	Delivery of 3 promised delayed rewards before choice	Age	ns	Hun-Food	34			-.23	-.14	.13	
		Hungry/Sat	ns	Hun-Non	34			.04	.15	.09	
7 yr. olds		Hun*Food	ns	Sat-Food	32			-.41*	-.27	.26	
		Hun*Food*Age Sex*ESex	ns p<.005	Sat-Non	35			-.22	-.37*	.30	
Alley & Schwarz								Learning Skills	Saves		Crandall et al.
10 yr. olds	50-50 chance for delivery of delayed reward	Hungry/Sat	ns	Hun-Food	52	-.17		-.30*	-.25 -.45*	.11	.02
		Hun*Food	ns	-Non		-.14		-.17	-.21 -.04	.12	.22
				Sat/Food	52	-.16		-.17	-.10 -.24	.02	.25
				-Non		-.01		-.23	-.16 -.23	.06	.05
Schwarz, Schrager, & Lyons								S-B Pict. Voc. IQ			
3-5 yr. olds	none	Delay	p<.005	7-hr del	33	.07	.12	-.31			
		Del*Age	ns								
				24-hr del	33	.00	.10	-.21			
Schwarz & Testa								PPVT IQ	Teacher Rating	Teacher Rating	Ford & Rubin
3-5 yr. olds	Delivery of 2 promised delayed rewards vs no promise	Trust	ns		49	.06	.03	-.05	.07	.22	-.32*
		Trust*Age	ns								

*p<.05

Table 4

Correlates of Three Measures of Delay of Gratification for Children 3-5 Years of Age from UConn Child Lab (N=49)

Variable	Choice Delay	Wait to Accum.	Delay Rating	Task Orient.	Extra-vert	Hos-tility	Social Desir-ability	PPVT IQ	Sex M=1 F=2	Age	Var.
Choice to Delay	- -	.46**	-.09	.07	.13	.22	-.32*	-.05	.06	.03	Choice
Wait to Accum.	.46**	- -	.15	.26	.13	.27	-.09	.30*	-.06	.22	Accum.
Delay Rating	-.09	.15	- -	.56**	-.19	-.33*	-.09	.15	.32*	.34*	Rating
Task Orientation	.07	.26	.56**	- -	.24	-.14	-.03	.21	-.02	.41*	Tk.Ort.

*p<.05 **p<.01

Table for Schwarz & Tes[illegible]

Table 5

Mean Wait-on-Request Scores for Male and Female Bermudians in Three Age Groups

Sex		Age in Months		
		24-25	26-27	28-30
Male	M	2.7	3.3	4.4
	N	(25)	(19)	(20)
Female	M	5.0	5.1	5.9
	N	(16)	(22)	(17)

Table 6

Regression of Wait-on-Request Scores on IQ, Sex, and IQ*Sex for Three Age Groups

Age Group	N	M	SD	F Value for Predictors IQ	Sex	IQ*Sex	R^2	R
24-25	41	3.6	2.7	29.20**	.63	1.89	.46	.68**
26-27	41	4.4	2.9	10.78**	3.09	.42	.28	.53**
28-30	37	5.1	3.0	8.85**	1.24	.29	.24	.49*

*p<.05 **p<.01

Schwarz, Scarr et al.

Schwarz 4.

Table 7

Correlations of Delay of Gratification with IQ and Activity Ratings at 2 and 4 Years of Age in a Sample of Bermudian Children (Ns 45 to 53)

Variables	Wait to Accum.	IQ 2	IQ 4	Act 2	Act 4	Act 2&4	CA 2	CA 4	Sex M=1 F=2
Wait Upon Request	.18	.61**	.60**	-.54**	-.45**	-.56**	.21	-.02	.28*
Wait to Accum.		.12	-.03	-.18	[illegible]	-.28	.36*	.32*	-.05
IQ 2			.74**	-.51**	[illegible]**	-.54**	-.12	.00	.21
IQ 4				-.41**	-.45**	-.53**	-.14	-.15	.08
Active 2					.58**	(.88)	-.15	-.01	-.22
Active 4						(.90)	-.17	-.20	-.23
Active 2&4							-.20	.07	-.26
CA 2								.52**	.07
CA 4									.29*

*p < .05
**p < .01

Schwarz, Scarr, Caparulo, Furrow, McCartney, Billington, Phillips, Grajek.

Table 8

Correlates of Delay of Gratification at 2 and 4 Years of Age for Male (Ns 21 to 25) and Female (Ns 24 to 27) Bermudian Children

Variable	Sex	Wait to Accum.	IQ 2	IQ 4	Act 2	Act 4	Act 2&4	CA 2	CA 4
Wait Upon Request	M	.57**	.75**	.68**	-.63**	-.45*	-.65**	.21	.04
	F	-.16	.36	.53*	-.40*	-.38	-.41	.18	-.30
Wait to Accum.	M		.41*	.27	-.62**	-.52*	-.72**	.54**	.43*
	F		-.23	-.37	.22	.12	.16	.15	.28

Table 9

Correlates of Wait-to-Accumulate for 3-5 Year Old Males (N=21) and Females (N=28) from the UConn Child Lab

Variable	Sex	Delay Rating	PPVT IQ	Task Orient.	Extra-vert	Hos-tility	CA
Wait to Accum.	M	.35	.24	.40	.48*	.47*	.44*
	F	.07	.33	.14	-.08	.14	.06

Schwarz & Testa